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THE NECESSITY FOR STATE OR FEDERAL REGULATION OF WATER POWER DEVELOPMENT

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A century and a quarter ago, a law was passed in the State of Vermont fixing the rates of toll that might be charged by owners of water-power grist mills for grinding grain. The law which thus regulated the conduct of a private business was enacted while Vermont was an independent self-governing commonwealth, before its entrance into the Union; and it remained on the statute books until a few years ago. The conditions of society and of industry when the law was enacted were in sharp contrast to those of the present day; yet the conditions which caused the passage of the law were not dissimilar to those on which legislation of a similar sort is to-day based.

The settlers in those thinly-populated pioneer communities were dependent on the grist mill to convert the grain their fields produced into usable form. But grist mills were very few and far between, and roads were often mere rough trails through the forest. The owner of one of these pioneer grist mills who took advantage of the settlers' necessity, to charge "what the traffic would bear," represented the public utility monopoly of that day.

It was to meet the extortion practiced by such eighteenth-century monopolies, doubtless, that the Vermont law was passed. It is noteworthy, however, that after this law had been on the statute books for more than a generation, an amendment was passed exempting grist mills operated by steam power. Apparently it was recognized that the public had an inherent right to regulate industries carried on by the use of water power. It is true that the English law of riparian rights was in force, and that the owner of a "mill privilege," as it was called, held title to it as to any other piece of real estate. Nevertheless, there seems to have been appreciation of the fact that water power was a gift of nature to the whole race, and that even though one held title to such a gift, he was subject in its use to legal regulation.

The conditions which brought about this early case of legal regulation of water-power plants soon passed away. The development of the steam engine put water power for many years in the background. It became much cheaper to develop steam power on the site where it was needed, than to locate the factory beside the waterfall. But in the late '80's, the application of electricity to industrial uses worked a revolution in the use of power. The electric light, the electric railway and the electro-chemical processes created new demands for power in enormous quantities. Coincidentally came electric power transmission, making it possible to develop power at the waterfall and utilize it at the mine, the mill or the electric distributing station, distant a dozen or fifty or a hundred or more miles away.

An enormous impetus was thereby given to the use of water power, and, at the same time, modern engineering came in to revolutionize the machinery and the methods by which flowing streams are harnessed to the service of man. The millwright of a century or even a half century ago knew no other method of water-power development than the mill dam in the river bed and the wheel or turbine beside it. Where the natural fall of the stream was located, there the power had to be utilized. Thus the owner of the land around a natural waterfall owned all that was necessary in order to utilize the fall for power.

But modern methods of dam construction and conduit construction have revolutionized this condition. Water may be taken from a stream to-day, led in artificial channels for miles away from its natural course, stored in artificial lakes, used for power development at some site remote from any stream and finally discharged, perhaps, in a different watershed from that in which it originally flowed. Thus in the development of the water power of a river to-day on a broad and comprehensive scale, the old law of riparian rights, which gives to each owner of the land on a river's banks a right to the fall that occurs in flowing past his land, is often a hindrance to the largest and most economical commercial development.

And there is a still more potent reason for this. That reason is the enormous influence of water storage upon water power. The old time water-power plant had its capacity fixed by the flow of the stream in dry weather. The torrents that flowed past in the flood

season were of no use, but on the contrary a source of great danger and frequent destruction. The only storage of the old-time mill was the little "mill-pond" above its own dam.

The variation in volume between a river at flood and at lowest water is enormous. In the arid regions of the far West, many streams, which are of large size when rain falls, become entirely dry at times. Even in the humid sections of the East, rivers vary enormously in their stage. The New York State Water Supply Commission in its fourth annual report, dated February 1, 1908, shows that the Hudson River, flowing out of the well-watered Adirondack region, with many lakes at its sources, has recorded a variation of 100 to 1 between the greatest and least flow at Mechanicville, or from 70,000 cubic feet per second in the flood of 1869 to 700 feet per second in the drought of 1908. Taking the average monthly discharge, the greatest was 30,900 cubic feet and the least was 1600 cubic feet. The same authority shows the variation of the flow of the Delaware River to be in the ratio of 375 to 1. The maximum flow at Port Jervis is 150,000 cubic feet per second. The least flow at the same point is 400 cubic feet per second.

Now, in the modern development of water-power plants what the engineer first looks to is the low-water flow and the extent to which this can be supplemented by storage. In the smaller streams it has often been possible by private enterprise to create storage basins and closely regulate the flow of the stream. There are rivers in the manufacturing districts of Massachusetts and Rhode Island whose flow has been almost completely equalized by storage, and whose available water power has been thereby multiplied many fold.

And this brings us to another great contrast between the old-time water-power development and that of the present day. Up to very recent times water-power development was confined almost wholly to small streams, many of them mere brooks. There was no demand for power to justify the use of large streams and no means for harnessing them had the demand existed. But to-day the largest rivers are being set to work. Power is developed by giant wheels generating ten thousand or more horse power on a single shaft. Cataracts and rapids which were supposed a generation ago to be beyond the power of man to control have been subdued. All along the Atlantic coast from Maine to Alabama, the largest rivers have been set at work turning spindles, lighting cities and drawing

railway cars. Niagara itself has been set to work and nearly half a million useful horse power are being produced by water drawn from the upper river, yet the diminution of flow over the precipice is too small to be perceptible.

The amount of power available on these great rivers can be multiplied many fold by storage; but the creation of that storage can be accomplished only through legislation of a broad and radical sort, and legislation which can only be justified with public interests and not private interests as the beneficiary.

Attention may also be directed to the relation between the use of water for power and its use for other public purposes. The water flowing in the nation's streams and rivers to-day is used not only for power development, but for the supply of towns and cities, for irrigation and for navigation. Further than this the great problem of river control, of protection from devastating floods and of the drainage of great areas of fertile swamp lands is intimately connected with the matter of water-power development. All these public uses of our streams and rivers were almost unknown when the existing law of riparian rights was developed in the narrow island of Great Britain; and, until recent years, there has been no serious conflict between these various interests. The streams on which water powers were developed, for example, were too small for navigation. The amount of water required for city supply was so small that the extinguishment of the rights of water-power owners was no serious matter.

These conditions exist no longer. Cities which seek to increase their water supply find themselves compelled to pay millions of dollars in damages for water-power plants and even for water powers unused and undeveloped. A free gift of nature—the potential power in a falling stream at a certain point—is held to be private property which must be appraised and paid for by the public before it has the right to interfere with it, even when the private owner has made no use of this gift, but has held it like Æsop's "dog-in-a-manger." It seems surely evident that the law which makes such gifts of nature private property was the outgrowth of conditions vastly different from those which exist to-day.

It is a curious illustration of our blind adherence to past traditions and written laws that in England itself ways have been found to escape from some of the rigorous conditions which we still impose

on ourselves as a result of our inheritance. An English city, wishing to take water from a certain district to supply its needs, does not have to condemn and purchase at exorbitant figures all the water powers fed by the impounded streams as an American city is compelled to do. The English city simply turns, from the reservoirs which it builds, enough water into the streams to maintain the *low-water* flow unimpaired. The water-power owner has as much water for his mill as before and is further benefited by relief from the danger of floods.

Still more remarkable are the fetters with which we bind and hamper enterprises for the public benefit. Even when an American city has gone to vast expense in securing a water supply and has condemned and purchased water powers for that purpose, it has been claimed that the city could not itself utilize and benefit by the water power which was created as an incidental to its storage of water. Fortunately this perversion of laws, made supposably for the public interest, to serve private ends has generally been overruled.

In the development of water for irrigation purposes there has been comparatively little conflict thus far between private owners of water-power rights and the public use for irrigation. This has been partly due to the fortunate fact that most of the water-power sites in the arid region of the West still remained in Government ownership when the Government irrigation work was undertaken.

In the reclamation work carried on by the Government in the arid West, water power is developed in many cases as an adjunct to the irrigation works and is often of great value, as many of these reclamation projects are located where fuel is expensive. The revenue gained from the sale of such power is applied towards paying the cost of the works.

It is in connection with the use of rivers for navigation that the necessity for public control of water-power development has been in recent months most forcibly brought home to the public. The control by the Federal Government of navigable rivers makes it necessary to secure from the Federal authorities permission to dam or divert the waters of any stream on which navigation may be carried on. Further than this, the work undertaken by the Government itself in improving rivers for navigation by building dams and locks upon them often creates valuable water powers.

In the past, such water powers have been at times turned over to private parties at a nominal rental, and the location of such powers and the fact that in the design of the works navigation and not power development has been the controlling idea, has often hindered the rental of such powers on a remunerative basis.

These conditions, however, are sure to be changed. The Federal Government is likely to undertake navigation improvements on some of the chief rivers and in connection therewith it is almost certain to embark on the great task of the regulation of interstate streams for the checking of floods and maintenance of the low-water flow. The result of such works will be the creation of many new sites for water-power plants and multiplication of the available power at many sites where water-power plants now exist. That private interests will seek to reap the benefit from this expenditure of public funds is certain; and they will make a hard fight to this end, for the prize is a rich one. The equities of the case are so clear, however, that these interests seem doomed to defeat. Where any public body—be it the national government, or a state or a city—creates a valuable water power in the course of its work for water supply, for irrigation, for navigation or for river control, that value belongs of right to the body that creates it.

To establish this principle is of enormous importance. The way is open for carrying out public works of vast value to the people, provided the benefit from such works in the way of water-power development can be made a public asset to bear part or all of the burden of cost. And further, if this principle is established, then works can be planned and carried out for the public benefit where the creation of power is a primary consideration.

The value of the undeveloped water powers of the country and the public rights therein, have been brought forcibly home to the people by President Roosevelt in connection with congressional legislation granting franchises for the use of such powers. On March 13, 1908, President Roosevelt wrote a letter to the Senate Committee on Commerce, in which he called attention to the frequent failure to guard the public interest in the grant by Congress of water rights to private companies and said:

"The effect of granting privileges such as are conferred by these bills, as I said in a recent message, taken together with rights already acquired under state laws, would be to give away properties of enormous value.

Through lack of foresight we have formed the habit of granting without compensation extremely valuable rights, amounting to monopolies, on navigable streams and on the public domain. The repurchase at great expense of water rights thus carelessly given away without return has already begun in the East, and before long will be necessary in the West also. No rights involving water power should be granted to any corporation in perpetuity, but only for a length of time sufficient to allow them to conduct their business profitably. A reasonable charge should, of course, be made for valuable rights and privileges which they obtain from the National Government. The values for which this charge is made will ultimately, through the natural growth and orderly development of our population and industries, reach enormous amounts. A fair share of the increase should be safeguarded for the benefit of the people, from whose labor it springs."

This was followed a month later by his veto of a bill relating to a franchise for a dam on the Rainy River, Minnesota, in which he laid down the principles that should control in the grant by the Government of such franchises. He declared that such grants should provide for some license fee or compensation, which, though small at the outset, can in future be adjusted so as to secure control in the interest of the public, and also that the grant should be for some limited term, "leaving to future generations the power or authority to renew or extend the concession in accordance with the conditions which may prevail at that time."

In a second message, in January, 1909, vetoing a bill permitting the construction of a dam on the James River, in Missouri, President Roosevelt again called public attention to the duty of Congress to protect the rights of the public in undeveloped water powers and showed how rapidly the great power plants are passing under the control of large financial interests. Information collected by the Bureau of Corporations showed that thirteen large concerns owned or largely controlled water-power or advantageous power sites equal to nearly one-third of the total water power now in use. Commenting on this condition, President Roosevelt said:

"The people of the country are threatened by a monopoly far more powerful, because in far closer touch with their domestic and industrial life, than anything known to our experience. A single generation will see the exhaustion of our natural resources of oil and gas and such a rise in the price of coal as will make the price of electrically transmitted water power a controlling factor in transportation, in manufacturing, and in household lighting and heating. Our water power alone, if fully developed and

wisely used, is probably sufficient for our present transportation, industrial, municipal and domestic needs. Most of it is undeveloped and is still in national or state control.

"To give away, without conditions, this, one of the greatest of our resources, would be an act of folly. If we are guilty of it, our children will be forced to pay an annual return upon a capitalization based upon the highest prices which 'the traffic will bear.' They will find themselves face to face with powerful interests intrenched behind the doctrine of 'vested rights' and strengthened by every defense which money can buy and the ingenuity of able corporation lawyers can devise. Long before that time they may, and very probably will, have become a consolidated interest, controlled from the great financial centres, dictating the terms upon which the citizen can conduct his business or earn his livelihood, and not amenable to the wholesome check of local opinion."

This declaration by the President received almost unanimous approval in the public press; but it encountered the bitter opposition of those interested in water-power development enterprises. These people, and those who speak for them on the floor of Congress and elsewhere, maintain that the water powers in question are as much private property as the land itself and that the Federal Government has no right to go one step beyond the protection of the interests of navigation. They deny the right of the public to share any part of the profit from the development of such powers by the imposition of licenses, and aver that even if the public has a claim upon the power because of its being a free gift of nature, that right belongs to the separate states and not to the nation.

There is, indeed, much to be said in support of the latter view, particularly where the older states are concerned; but it is noteworthy that the interests engaged in water-power development are as unwilling to admit the claims of the states themselves as of the nation. A notable example is found in the state of New York, where Governor Hughes in his first message called attention to the potential value of the state's undeveloped water powers and urged that: "they should be preserved and held for the benefit of all the people and should not be surrendered to private interest." Following out this policy, in 1907 Governor Hughes vetoed a bill granting a franchise for power development on the St. Lawrence River and was successful in securing a revision of the law by which the company receiving the franchise is to pay a substantial annual rental into the state treasury.

It may be of interest to see what would be the logical outcome if we were to accept the claims of those who would limit the Federal Government to the control of navigation interests solely. Suppose it to be established that the Federal Government and its officials are limited strictly to the use of rivers for navigation. Manifestly, then, all work done by the Federal Government for river improvement must be done with this sole end in view—as indeed it has for the most part been done in the past. The use of a river to create power, to irrigate farms or even to supply a city with potable water as well as the opportunity to restrain its floods and maintain its flow unimpaired must all take second place to the use of the streams for navigation.

Now, as a matter of fact, the use of a river for navigation is its least valuable use. All other uses confer greater benefit upon the public. Manifestly, then, it is against public policy to confine the Federal Government's functions in the treatment of rivers to navigation solely. Federal action for the control of our great rivers is far more needed and would be far more beneficial for water-power development and for regulation of the volume of flow than for navigation.

But if the theory of the defenders of private water rights holds good, the least beneficial use of our streams must take precedence over all others and we shall see such absurdities as the taking of water from streams for public water supply condemned because of injury to navigation.

In the older states of the East, the right and duty of the states to control water-power development within their borders is rapidly being established. The State of New York leads all others in water-power resources. The 1909 report of the State Water Supply Commission showed 828,784 horse power already developed by water in New York. Step by step, by the logic of necessity, the state has been forced toward the policy of state control. The problem of flood prevention, of water supply to the state canal system, of protection of cities from water famine in drought and of the best development of the vast water powers of the state still unharnessed all conspire to force the state itself to undertake the work. For years state commissions have been studying the subject. It has been attempted to control a river's flow and develop its water power by assessing the benefits upon all the riparian owners affected, including

cities, counties and other public bodies. It was found impossible to finance the work so planned.

The latest report of the State Water Supply Commission comes out strongly for state control and it summarizes the "Reasons for State Control" as follows:

"Aside from the need so emphatically expressed by Governor Hughes of conserving this resource to the use of all the people, there are reasons why the state, which has a far wider scope than any lesser authority, could more advantageously supervise the development and administration of its rivers. By means of a comprehensive policy, taking into consideration present and future development of all parts of every stream, the state can control hydraulic development step by step as conditions demand and eventually realize the most complete and economic utilization possible.

"Development by private enterprise, on the other hand, involves necessary limitations and wasteful methods. Individuals or corporations cannot exercise the necessary power of condemnation required for the creation of water storage. Co-operation between a number of mill owners for the purpose of river control is peculiarly difficult to arrange and the benefits hard to apportion to the satisfaction of all. As a result private enterprise seeks conditions promising the greatest immediate return on the capital invested. This frequently involves the development of only the major portion or 'cream' of a given fall, leaving the remaining portions above and below undeveloped, while effectually stopping their development by any other company or even by the state.

"On the other hand, the state, in such a case, having the financial ability to make great expenditures, and to wait many years, if necessary, for the return on its outlay, could build the works necessary to utilize the entire fall of the river without waste. Such development could be carried forward in sections, as a market for the controlled water or for the developed power might arise from time to time. The essential point is that the development be in accordance with a pre-established plan.

"Such foresight on the part of the state in the control and development of its rivers would also provide for the location of mills, railroads and other industrial structures in such a way as not to interfere with the eventual construction of the necessary storage works. This is an important factor. Had the policy of water-power development by the state for its benefit and the welfare of the people been established earlier as one of the fixed purposes of the state, there is but little doubt that all of the improvements at Tupper Lake Junction could have been as well placed with slight, if any, additional cost to the individuals and corporations concerned, outside the area of possible state work. If the railroad companies and lumbermen had so co-operated in locating the line of the road, its switches, roundhouses, etc., and in selecting sites of the great lumber mills and other interests, a great reservoir which would benefit all of these institutions and many more could be

constructed for a few thousand dollars where it now will take as many millions. . . .

"It thus appears that the widest possible distribution of benefit will result only when the state itself undertakes the supervision of the construction of storage reservoirs. Such constructions under private enterprise are peculiarly apt to be unsatisfactory in every way from the public point of view."

Another important reason for Government control of water-power development is that public safety may be secured. Experience has abundantly demonstrated that when private enterprise wholly without public control attempts to deal with natural waterways, there will be many cases of incompetence and neglect with consequent disaster. Of the terrible casualties which such incompetence can cause, it is sufficient to refer to the Mill River catastrophe in Massachusetts; to the Johnstown flood in Pennsylvania, and to the breach in the banks of the lower Colorado River which came so near flooding and destroying for a century to come the possibilities of a great undeveloped region in the far southwest.

These and similar disasters furnish ample proof that private interests cannot safely be allowed to tamper with the water courses of a nation, and that any work done upon such streams should be under such supervision as will guard the public interests and the public safety. It is noteworthy that this fact has been recognized and made the basis of legislation in the smallest state of the Union. Rhode Island has for years had a Commissioner of Dams and Reservoirs, charged with the supervision of all structures erected to impound natural waters.

It is true that thus far the actual development of water power in this country is almost wholly in the hands of private enterprise. A few cities have developed water-power plants for municipal lighting, notably Chicago, which, in connection with its great drainage canal, has developed a large water power. Illinois is to undertake a \$20,000,000 work for navigation within its borders with the expectation that the water power thereby developed will be of such value as to repay the entire outlay. Los Angeles, on the 240-mile conduit which it is building for a water supply, will develop a large amount of power. It may be said, however, that direct state work in the development of water power is still in the future.

In other countries, however, the state control and utilization of water power has proceeded much farther than in our own avowedly

democratic country. In France, in Switzerland, in Italy we find great strides being made to secure for the people at large the benefit from water-power development and to restrict and limit the rights which the owners of lands adjacent to a waterfall may exercise. In Switzerland particularly, with its wealth of water power, the bulk of the water-power development has been done by cities and cantons for their own use.

Our own law of riparian rights, by which the owner of land on a river's bank has thereby rights to the use of its waters, we obtained from our mother country, England, and in England to-day that law is still unquestioned. The reason is easily seen. British water powers are all trivial in size and in commercial importance. There is not the slightest reason why they should not be left in private hands.

Far different is the situation in the English colonies. In Australia water is a precious commodity. In the colony of New South Wales the Government retains the ownership of a strip of land sixty-six feet wide along all waterfronts, and thereby extinguishes all riparian rights which would interfere with the public use of the rivers for power, for irrigation, for water supply, and even for fishing.

Not long since, the writer received a letter from a well-known American engineer, who has held high position in both state and federal service, and who is now in charge of important work in Australia. Contrasting the Australian treatment of water rights and our own, the writer of this letter remarks:

"All over the West water is going into the control of syndicates and trusts, and in the East the water power which ought to be treasured as a public resource to give its benefits to all is passing into the ownership of the predatory stock jobber and the people at large derive no benefit from it whatever.

"It is a prodigal, blind, unpatriotic notion along every line which has to do with public resources or the public good. When are we to wake up?"

But we do not need to go to the antipodes to find examples of radical treatment of water-power monopolies. Our own near neighbor, Canada, in its chief province, Ontario, has already established a Government Commission to deal with this problem. That commission made an exhaustive investigation to determine the actual

cost of water-power development and of electric transmission. Armed with this data, it was able to purchase power on reasonable terms at wholesale from one of the companies which has developed Niagara power on a large scale. The commission is itself undertaking the distribution and sale of that power to various cities in western Ontario.

Two alternatives are before the people of the United States. The first is to permit the water-power resources of the nation to be exploited solely by private enterprise and for private enrichment. Such a course means either that only a small percentage of the possible power can be developed, or that state or national funds must be expended on the work of river regulation and the largest share of the benefit will be reaped by the water-power syndicates. It is true that after a lapse of years the rates charged by private water-power companies may be subject to regulation by law, but one recoils before the long vista of agitation, legislation and litigation which such a course would make necessary.

Is there not a better way to protect the interests and property rights of the public in this great national resource? The other alternative is that better way. The public, through state or federal authorities, should assert its rights to control all undeveloped water powers as well as the increase of power which may be brought about at developed power plants through water storage. Private property owners must, of course, be justly treated; but where their rights have to be extinguished by condemnation, it should be at a really fair value and not at the exaggerated valuation often placed on water-power plants. For it should be understood that over a large part of the eastern United States, where cheap coal is available, the cost of steam power has been brought to so low a point in recent years that water power has to be developed at very low cost to enable it to successfully compete with steam.

Yet this, it must be remembered, is a passing condition. The coming exhaustion of our stores of mineral fuel is certain to be reflected in higher prices for coal and consequently higher cost of steam power before the present generation has passed away. To the next generation the "white coal" of the waterfall will be as valuable here as it is now in Switzerland or Italy. We may therefore readily preserve the benefit of this great natural resource to future generations and at the same time give full scope to private

enterprise and energy. Let the government, state or federal, supervise the development of water powers as a part of the large work of river regulation and control. Let it retain the title to our great water-power resources, granting franchises to private companies to use the power for limited terms of years under proper restrictions and with suitable rates of compensation.

Only by the adoption of such a policy can the great water-power resources of the nation be effectively developed. Only by such a policy can the great value of these resources be conserved for the people as a whole instead of exploited for the enrichment of the few.